

ABSTRACT OF THE DISCLOSURE

A method and apparatus for laser light pulse stretching is disclosed which may comprise a beam splitter in the path of a laser output light pulse beam; selected to pass a first percent of the energy of a first input pulse of the laser output light pulse beam along a laser output light pulse beam output path as a first output pulse and to reflect a second percent of the energy of the laser output light pulse beam into a first delayed beam; an optical delay path receiving the first delayed beam and returning the first delayed beam to the beam splitter in an orientation such that a third percent of the first delayed beam is reflected into the output path as a second output pulse and a fourth percent is passed into the optical delay path as a second delayed beam; the optical delay path receiving the second delayed beam and returning the second delayed beam to the beam splitter in an orientation such that the third percent of the second delayed beam is reflected into the output path as a third output pulse and the fourth percent of the second delayed beam is passed into the optical delay path as a third delayed beam; the optical delay path receiving the third delayed beam and returning the third delayed beam to the beam splitter in an orientation such that the third percent of the third delayed beam is reflected into the output path as a fourth output pulse; the first input pulse being a first pulse in a plurality of pulses output from a prior pulse stretcher, each of a plurality of succeeding input pulses comprising the output of the prior pulse stretcher resulting from the stretching of a narrow band laser light output pulse, forming successive first, second, third and fourth output pulses, the combination of which forms a pulse stretcher having an output with TIS of at least 200ns. The optical delay path may be formed of a plurality of at least eight reflecting mirrors and contained in an elongated enclosure having first and second end plates mounting a first group of at least four of the at least eight reflecting mirrors mounted on the first mounting surface symmetrically about a center axis of the optical delay path and a second group of at least four of the at least eight reflecting mirrors mounted on the second mounting surface symmetrically about the center axis. The mirrors may be staggered in a predefined pattern, e.g., a circular pattern. The delay path may lie in a plurality of planes. The apparatus may be part of a laser system, part of a beam delivery system or an interface between the two.